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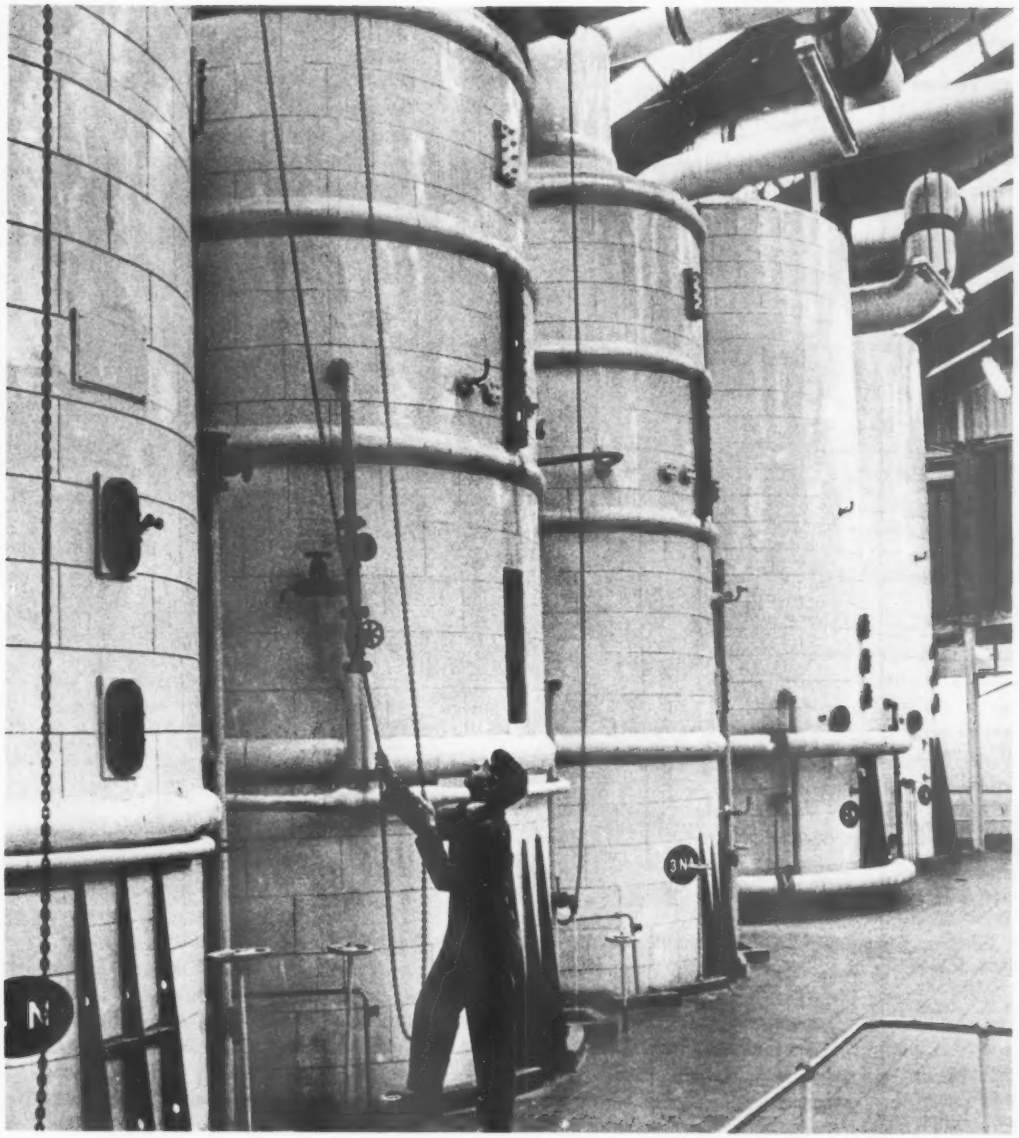

U.K. sugar refinery

Crop Reports by Satellite

Canadian Oilseeds

August 30, 1976

Foreign
Agricultural
Service
U. S. DEPARTMENT
OF AGRICULTURE

FOREIGN AGRICULTURE

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LACIE Project Launches Crop Reports Via Satellite

By ROBERT C. TORRENS
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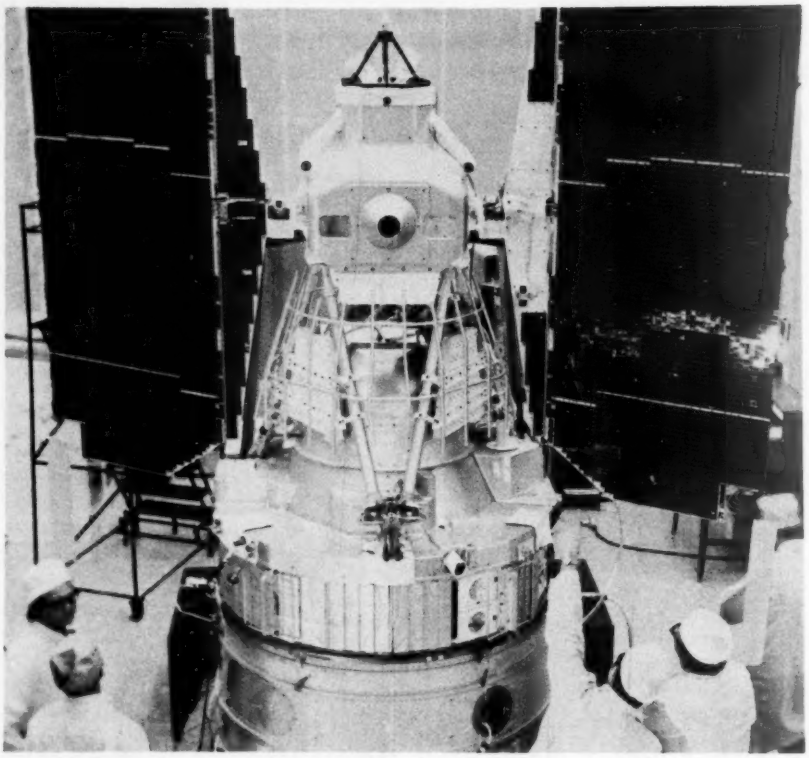

Landsat 1 spacecraft undergoing tests prior to launching.

ONE DAY last week a satellite named Landsat 2 passed over a strip of the U.S. Great Plains continuously scanning the ground below to measure the refltcted light intensity in four spectral (wave-length) bands.

The satellite, second in a series to be launched by NASA, transmits digital data to ground stations where it is recorded and used by many U.S. and foreign researchers to learn more about the earth and its soil, water, minerals, animals, and vegetation. The Large Area Crop Inventory Experiment (LACIE)—a project to test the crop reporting possibilities of space satellites—is one of the many users of Landsat data.

The experimental project known as LACIE is a cooperative effort by the U.S. Department of Agriculture (USDA), the National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce. The Foreign Agricultural Service (FAS) is the lead USDA agency in the project.

The LACIE objective is to determine the feasibility of crop estimation using remote sensing techniques combined with weather-yield regression modeling. Wheat was chosen as the experimental crop, and the U.S. Great Plains was the initial test area. As capability is verified, the experiment is being expanded to include other important wheat-producing areas in the United States, Canada, and other countries (see article on page 3).

LACIE formally began with the signing of an interagency agreement by USDA, NASA, and NOAA representatives on October 10, 1974. It is designed to operate during 3 wheat crops years, 1974/75 through 1976/77, and is scheduled to end with a final evaluation report on June 30, 1978. LACIE is not an agency but an experimental project with a beginning and an end. It will, however, provide a base for future operational crop estimation programs if LACIE technology proves to be successful and cost effective.

The project is divided into three phases. Phase 1 has been completed. It was devoted to developing the facilities, methods, staff, and skills needed to conduct operational tests. LACIE is now in Phase 2—making a full crop year test run in the U.S. Great Plains, Canada, and limited areas outside North America. Wheat area, yield, and production reports are being generated on a monthly schedule and compared with conventional USDA estimates. These reports are evaluated for potential utility to USDA users.

During Phase 3, LACIE will be a full-scale test, covering other important wheat-producing countries besides the United States and Canada. Also during Phase 3, LACIE will test special techniques for evaluating damage to crops by drought, winterkill, disease, flood, insects and other events that reduce productivity.

Although each LACIE task requires cooperative efforts by all three agencies involved in the project, each agency has lead responsibility for specific jobs. The USDA leads the effort to define output product requirements, produce the crop reports, and evaluate their potential usefulness to USDA agencies. NOAA is in charge of providing meteorological data, and developing and operating agricultural-meteorological models to estimate yields. In addition to providing the Landset 2 spectral data, NASA is responsible for the overall project design and management and operates the crop classification and measurement system.

A typical LACIE crop report is done in three steps:

- Wheat acreage is estimated from spectral data received from Landsat 2;
- Yield is predicted based on historic trend and monthly weather data provided by the National Weather Service from the World Meteorological Organization (WMO);
- The two are combined to arrive at a production estimate. A narrative report is written describing the current estimates and reviewing factors that affected the estimates to provide a basis for evaluating them.

Each of these three jobs is performed by a separate subsystem or group within LACIE.

The Classification and Mensuration Subsystem (CAMS) uses historical cropping data, Landsat 2 spectral data,

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dialogue at LACIE

ORBITING some 570 miles above earth and taking frequent looks at every major cropping region in the world, the space satellites Landsat 1 and 2 are beaming back a wealth of new data for the LACIE project—possible precursor of a worldwide crop reporting system.

In an interview with *Foreign Agriculture*, three staff members of the LACIE project—Del Conte of the Foreign Agricultural Service; David Thompson, Statistical Reporting Service; and Harold Hansen, Soil Conservation Service—describe progress made so far toward developing such a reporting system.

Question: Tell me something about the Landsat satellite.

Thompson: Landsat is a satellite in an orbit that lets it examine the same spot on the earth's surface every 18 days. It records spectral data on four bands—two invisible infrared bands and two visible bands. Landsat was launched in 1972 and is still operating. With this and Landsat 2—launched in January 1975—we acquire data every 9 days.

Question: Are any other Landsats going to be used?

Conte: There is another satellite on the drawing board—Landsat C, which is to be launched in the fall of 1977.

Question: Describe the picture that comes off the satellite.

Thompson: It is not a picture as such, but rather a digital value or number that is assigned and then electronically created into a picture. What we commonly think of as green on the ground is actually red, so the analyst looking at the picture has to revise his thinking.

Question: Would you describe a typical operation?

Thompson: The Landsat data comes in on computer tape and a photographic image is produced. We then take the data and locate the statistically selected 5- by 6-mile sample segments. A photo analyst or interpreter looks at the image and, using other data such as crop calendars and soil information, selects fields that are wheat. These fields are used to train the computer, which then classifies the entire segment and comes out with the percentage of wheat in the 5- by 6-mile area. This percentage of wheat is then expanded to project the number of acres of wheat for a given region.

Question: How do you calculate yield?

Hansen: At the beginning of the LACIE project, yield models were developed, based on historical weather and yield data. The basic yield models are modified by current weather data to calculate the yields for the current year.

Question: What countries will be covered by LACIE?

Conte: The LACIE plan is to look at wheat in the United States, Canada, the USSR, the People's Republic of China, Australia, Argentina, India, and Brazil. These countries were selected because they are major wheat producers. During Phase 1, the project designed and implemented the sampling methodology to be employed, experimentally tested yield models, and operationally tested the Landsat area estimation procedure in the U.S. Great Plains. We are now more than halfway through Phase 2, which began in October 1975 and ends this October. During this phase, three countries are being worked operationally—the U.S. Great Plains, the Canadian Prairie Provinces, and two indicator regions in the USSR, one for spring wheat and one for winter wheat.

During Phase 2, we have been trying to demonstrate that the LACIE system can produce timely wheat acreage, yield, and production forecasts throughout the growing season. We are also looking at a few selected samples in the PRC, Australia, Argentina, India, and Brazil to see what technical problems might occur when we expand our operations to those

Crop Reports *Continued*

and massive data-processing support to estimate the proportion of small grains to total land area in statistically selected sample segments.

The Yield Estimation Subsystem (YES) uses meteorological data, historic yield data, and regression techniques to forecast wheat yields. Yields are forecast for contiguous cropping regions having similar cropping conditions (crop type, climate, cropping practices, and other similarities. In the U.S. Great Plains, these are the Statistical Reporting Service (SRS)Crop Reporting Districts.

The Crop Assessment Subsystem (CAS) uses proportioning to make wheat area estimates from the calculated proportions of small grains. By combining these with the yield estimates, the Subsystem estimates production and writes the LACIE Crop Report.

LACIE produces crop estimates which, while still experimental, may be considered under the law to be "speculative crop information" and which could be confused with conventional estimates issued by the USDA. Because of this, LACIE develops and handles crop estimates in a strict security mode.

Also, LACIE estimates are not official USDA estimates, but rather experimental results. As such, they are made publicly available only after they have been thoroughly evaluated.

The experimental nature of LACIE also requires a demonstration that the results were arrived at independent of current official USDA estimates. To assure this, each CAS report containing estimates of U.S. wheat must be in the mail and postmarked or in the hands of evaluators before the release of the SRS estimates. This requirement, along with detailed records of the input data used and procedures followed, provides proof that LACIE estimates are entirely independent of current SRS estimates.

Also, appropriate procedures in SRS assure that the official SRS estimates are completely independent of the LACIE estimates. This independence greatly simplifies the task of evaluating the accuracy and objectivity of the LACIE estimates.

So far, LACIE has been a learning process. During Phase 1, a number of unsuccessful procedures were tried and discarded. Others were reexamined to see how they could be altered to be made successful.

One of the more important of these procedures is called "signature extension." Stated simply, this is the process of telling a computer "look at the spectral data (signature) for these fields of wheat in this area and remember it; now apply the stored information to the spectral data from this other location with similar climate, geography, and wheat-cropping practices and identify fields with the same signature.

To date, signature extension has not

Dialogue *Continued*

wheat regions. I want to stress that LACIE is an experiment. Crop reports will not be published as forecasts, but will be used retrospectively to assess LACIE's performance.

Question: What are indicator regions?

Conte: There are 1,950 sample segments for the USSR. However, our resources are limited and evaluations are possible from less than full country estimates. So, during Phase 2 we are analyzing 950 segments in the USSR, or about half the total. Since the segments are about equally divided between the spring and winter wheat regions, we refer to them as "indicator regions."

Question: Tell me about Phase 3.

Conte: Phase 3 begins in November 1976. We have not made firm decisions yet on the scope of this phase. The extent of coverage in Phase 3 will largely depend on Phase 2 results and available resources.

Question: I understand you are planning an ongoing project.

Hansen: The formal experiment ends in July 1978. However, the USDA LACIE team is developing and testing a plan that would permit a progressive transition from the experiment to an operational crop forecasting system if top-level decisions go in that direction.

Question: What are your goals and have you achieved them?

Conte: The objective for accuracy is to be within 10 percent of the true value 90 percent of the time. During Phase 1, we did not meet this goal. Since this was primarily a system testing phase, it was not anticipated that we would. So far during Phase 2, we have done very little statistical analysis of the data, but the estimates seem to be falling within the criteria mentioned before.

Question: How do they compare with results of USDA's Statistical Reporting Service?

Conte: This system is not designed to provide the yearend accuracy of the SRS, which on a national level usually comes within 1 or 2 percent of actual crop production. Rather, we are comparing LACIE estimates with the official SRS estimates as part of our evaluation process. LACIE itself is really designed for use in foreign areas where there are no statistical descriptions as we currently know them. We are trying to get the system to meet a 10 percent or less error criteria. It will not supplant SRS because we do not believe we can get down to 1-2 percent error levels with the system as it now exists.

Question: Can you foresee the day when it will actually have better results than SRS?

Conte: You are talking about two difftrent systems. SRS uses an extensive onground sampling system. LACIE is based on data collected from the Landsat satellite and current weather data. The beauty of the Landsat system is that you do not have to rely on extensive ground sampling to produce an estimate. This is very important in many foreign areas. Timeliness is of great importance, both for foreign and domestic reports. The Landsat satellite covers the earth every 18 days, and, hopefully, estimates can be almost real-time during the life of the project.

This in itself is a big improvement over current systems.

Question: This would be especially important for countries like the USSR and the PRC. Could you elaborate?

Conte: Reporting on the USSR is substantially better than for the PRC. There is little data coming out of the PRC. We have found that current crop information for foreign areas is sometimes pretty skimpy and that the estimates may not be very reliable even at the end of the season.

A LACIE-type system should provide better and more timely crop information for use by decisionmakers in foreign areas where the reliability and timeliness of data are questionable.

worked, perhaps because there was not enough similarity between the areas selected to test the process, or there was too much variability within the individual regions. Special efforts are now being made to partition world wheat production into areas that are as homogeneous as possible in terms of climate, topography, soils, and cropping practices. This change may provide a basis for retesting signature extension.

THERE have been other problems—some related to staff inexperience and some related to faulty experimental design. These are being eliminated one by one. So far, no insurmountable problems have been identified.

If LACIE is successful, the USDA will be able to monitor developments affecting world wheat, and perhaps other crops, during the growing season with a degree of accuracy heretofore unknown. The importance of this is only partly demonstrated by the economic repercussions of the Russian grain crop failures in 1972 and 1975. The many economic benefits of more accurate or more timely wheat crop information include:

- Better private sector planning of production and marketing—farmers, country elevators, merchants, processors, and the like can make more rational decisions on planting, buying or selling, adding or reducing storage capacity, and many other agriculture-related ventures.
- More effective public-sector program operation—export, price support, food donation, and other Government programs could be carried out in ways that lower costs or more effectively accomplish desired results.
- Improved price stability—even without additional Government supply management, farm and food prices would be more stable because of the more rational decisionmaking in the private sector and the more precise and timely management of current Government programs.

If successful, LACIE will not be a panacea for the USDA, but an important tool toward fulfilling the Department's mission. Considerable money and effort and a lot of interagency cooperation are required to make sure the technology is suited to the job. But the risks are well worth taking. Farmers, merchants, and consumers in the United States and an increasingly hungry world all stand to benefit.

Canada Likely To Harvest Smaller Crop Of Oilseeds

By DAVID W. RIGGS
Assistant U.S. Agricultural Attaché
Ottawa

CANADA's 1976 oilseed production—assuming normal weather and average yields—is likely to total only about 1.5 million metric tons, a substantial 1 million tons less than the aggregate 1975 harvests of major oilseeds.

The expected cut in rapeseed production will account for about 75 percent of the declining output, with reduced or unchanged areas sown to flaxseed, soybeans, and sunflowerseed making up the rest.

Competition from wheat for area and declining export sales are major factors in farmers' decisions to plant less rapeseed (the leading Canadian oilseed) and flaxseed. Sunflowerseed area (small, compared with that assigned to other oilseed crops) is probably equal to 1975's. Soybean production, centered in southwestern Ontario, must compete with corn for its place in the Canadian vegetable oil and protein feed sectors.

Rapeseed. Canadian plant breeders have led a successful search for low erucic acid, high-yield varieties of rapeseed, and new varieties with low content of glucosinolates have now been achieved.

The search for low erucic acid, low glucosinolate varieties that are yellow seeded (thin hulls, hence low fiber content) has met with success at the laboratory level. The resulting products are expected by the Canadians to be fully competitive with soybean products.

Planting intentions on May 25 indicated a 1976 rapeseed area of only 768,900 hectares, 829,600 fewer hectares than were sown in 1975 and in line with currently anticipated demand for rapeseed and products in 1976/77.

Rapeseed production in 1975 is estimated at 1.6 million tons—about 742,000 tons more than is projected for 1976.

Rapeseed oil production in 1975/76 is estimated at 129,000 tons, up by 32,000 tons from that of the previous year. Output in 1976/77 is expected to increase marginally.

Production of rapeseed meal in 1975/76 rose to an estimated 197,000 tons, reflecting the increase in crushing.

Exports of rapeseed are expected to be substantially higher in 1975/76 than those of the previous year, when the industry was paralyzed by strikes. However, they will not recover to previous levels because of a change in Japan's policy flowing from the 1974/75 disruption of supplies and the fear of interruption of supplies of both Canadian rapeseed and U.S. soybeans. Japan has been buying sizable cargoes of French soybeans at subsidized prices set by the European Community.

Canada's rapeseed exports during August 1, 1975-April 28, 1976, totaled 515,000 tons, compared with 424,000 tons during the comparable year-earlier period.

The domestic crush of rapeseed in 1976/77 should show a moderate expansion on the basis of demand for low glucosinolate rapeseed meal (RSM) for the western Canadian livestock industry.

Stocks of rapeseed on August 1, 1976, should be about 794,000 tons, substantially above the previous carry-in total of 400,000 tons, on the basis of disappointing exports.

Japan is by far Canada's leading market for rapeseed, followed by the Netherlands and West Germany. Bangladesh receives large quantities of rapeseed through the Canadian international food-aid programs. Mexico took 39,000 tons of rapeseed in 1974, but none in 1975.

RAPESEED exports during 1974/75 at 593,000 tons were sharply lower than those of the previous year and only half of the historic high of 1.2 million tons achieved in 1972/73.

Exports during 1975/76 should reach 703,000 tons, with a modest retrenchment in 1976/77. There have been no significant transport delays during 1975/76 and labor peace is expected to continue through 1976/77 as a result of the recent agreement by West Coast grain handlers to submit to arbitration.

Canada became a substantial exporter of rapeseed oil in 1972/73, shipping 23,800 tons that year, but exports have declined in the succeeding

years, partly because importing countries find it to their advantage to import raw materials and perform their own processing. However, rapeseed oil will continue to be shipped by Canada to India and Bangladesh under long-term credit and food-aid programs.

Rapeseed meal exports fell from 60,662 short tons in 1973/74 to only 11,764 short tons in 1974/75, reflecting greater availability of alternative superior protein sources. Only shipments to the United Kingdom held at a steady level during this period.

CANADA'S rapeseed crushing industry recovered in 1975/76 from its low level of activity in 1974/75, processing an estimated 340,000 tons of seed. However, it will be another year before significant quantities of low glucosinolate meal are available, allowing much higher feeding rates than are now possible. Plans for expansion of crushing capacity in western Canada have been curtailed.

Increased crushing of rapeseed in western Canada probably will not come about until the economics of moving rapeseed oil and meal to market are brought into line with the cost of moving rapeseed to export position.

Rapeseed is now moving at or near the Crow's Nest Pass rate for export of grain. But rail tariffs for rapeseed meal and oil are substantially higher. Some downward adjustments in the rates for moving rapeseed products have been announced, but these adjustments do not go far enough to solve the cost problems of the western Canadian crushing industry.

Rapeseed stocks on August 1, 1975, were 400,000 tons, reflecting a partial rebuilding toward levels of earlier years. Further stockbuilding is expected during 1976 because of slow farmer deliveries and lagging exports. However, these stocks will be necessary in 1976/77 if the lower level of planting intentions is carried out.

Stocks of rapeseed meal in crushing plants were reported at 8,500 tons on August 1, 1975, almost three times the year-earlier amounts. Except for the 11,000 tons in store on August 1, 1973, this stock situation is the largest in history. Rapeseed oil stocks on August 1, 1975, were 3,350 tons—about average.

Rapeseed prices (No. 1 grade, basis in-store Thunder Bay) on the Winnipeg Grain Exchange averaged $7.23 during the 1974/75 crop year—up 88 cents per bushel over the year-earlier level and about twice the average price of 1973/74. Prices gradually weakened, but by late July had recovered to about $6.80 per bushel.

Premiums may have to be paid by the trade to coax supplies off the farm. Producers have exercised considerable control over the marketplace this year through self-limitation of deliveries.

Soybeans. Canada is a minor producer of soybeans, and has been an important market for U.S. exports of soybeans. Canadian production in 1975/76 was up 87,000 tons over the 1974 total to 367,000 tons on reduced area. Yields reached 23.3 quintals per hectare—some 3.3 quintals above average. Planting intentions indicate a further 8,000 hectare reduction in area from the 1973/74 high of 190,000 hectares to 146,000 in 1976.

Soybean meal and oil production during 1975/76 is expected to reach 535,000 and 116,000 tons, respectively—a modest increase over 1974/75 levels resulting from the increased crush. Production should hold steady in 1976/77 because of the delayed entry of low glucosinolate rapeseed meal into the eastern market.

Imports of soybeans, all from the United States, are expected to be up substantially in 1975/76 to 408,000 tons. Soybean oil imports on the order of 20,000-30,000 tons—all from the United States—are likely during 1975/76, with no appreciable change forecast in the following year.

Part of the forecast for 1976/77 trade in soybeans and products depends upon the speed with which the projected new $42 million plant at Windsor is constructed and brought into production. This new facility will replace a plant on the Toronto shoreline that has been displaced by plans for a waterfront park.

Area devoted to soybeans in 1975 was 10,000 hectares less than in 1974. However, yields were up by 40 percent to produce a substantially larger crop of better quality.

Soybean oil and meal production were up in 1975 and exceeded the 1974/75 level by a 55,000-ton margin. Although the pork and poultry sectors have contracted somewhat this year, dairy farmers increased the use of feed rations by 14 percent during the dairy year beginning April 1, 1974, in order to gain as much production quota as possible for subsequent years, and this expansion was reflected in the increased demand for soybean meal.

Canada's exports of soybeans fell from 27,500 tons in 1973 to 13,100 in 1974 and to only 8,700 in 1975, but imports of soybeans for the crushing industry totaled 408,000 tons in 1975/76—a substantial increase over year-earlier levels. Soybean meal imports from the United States also are growing.

Canada's total soybean crush for 1975/76 is estimated at 680,000 tons, compared with 642,000 in 1973/74 and 635,000 in 1974/75. The 1975/76 crush plus imports and stocks will make 780,000 tons available for consumption and stocks carry-out in 1975/76. The 1976/77 supply utilization is not likely to vary significantly from 1975/76 levels.

SOYBEAN oil consumption hit a record 125,000 tons in 1974/75 and will exceed this mark by a small margin in 1975/76. The question is whether consumption is likely to decline in the future because of blending of rapeseed oil and palm oil for multipurpose use.

Flaxseed. Although Canada is one of the world's three major exporters of flaxseed, the industry has been forced further into decline each year as other products substitute for linseed oil. Planted area is down by 32 percent this year from last year's level to only 384,500 hectares. Exports have declined from 433,200 tons in 1973 to 351,000 in 1974 and only 244,900 tons in 1975.

Sunflowerseed. Area sown to sunflowers in 1976 is estimated at 60,000 hectares, compared with 1975's 62,000 hectares. The entire crop of about 22,000 hectares. The entire crop of about 22,000 tons is contracted for and is destined for the birdseed and confectionery sectors, as well as the oilseed sector.

Fish oil and meal. Production of fish oil and fish meal is concentrated in the Atlantic Provinces where, for locational reasons, most of the product is exported offshore rather than transported for consumption within Canada.

The industry has been declining, and the Government is offering revitalization programs. Production of fish meal in 1975 amounted to 45,000 tons, compared with 53,000 tons in 1974. Output of fish oil totaled about 10,000 tons in 1975, compared with 11,000 tons in the previous year.

Oilseed Meal Imports Up in Six Markets

By ALAN E. HOLZ
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COMBINED net imports of all oilseeds and meals into six selected markets rose during October 1975-May 1976 to 11.6 million tons, soybean meal equivalent (SME)—up 18 percent or 1.7 million tons above shipments in the same 8 months of 1974/75.

The increase represents a sharp acceleration in demand from the depressed 1974/75 volume, when net imports at 9.8 million tons (SME) were only slightly above those of the 1973/74 period.

Imports by the United Kingdom rose by about a third, and Spain and Denmark registered gains of at least a fourth. France's imports were up by more than a sixth, and West German imports gained by 13 percent.

However, recovery in Japanese imports amounted to only 8 percent and continued to lag the record level of the 1973/74 period. Most of the aggregate increase in meal consumption in the six countries reportedly was used in swine and cattle rations, although animal numbers have not changed appreciably.

Factors influencing these gains included reduced stocks, following last season's decline in net imports of oilseeds and meals, in anticipation of lower prices. As meal prices declined they became more favorably priced relative to grain.

Also grain prices were unusually strong as a result of relatively tight supplies, and some improvement in economic conditions worked to strengthen livestock prices and improve producer profitability ratios.

Together with a small net gain in animal numbers, these factors slammed this season's meal consumption into high gear.

Expansion in soybean meal imports has occupied a dominant role in this season's meal consumption growth. Aggregate net imports of soybeans and meal into the six selected markets during the current season through May rose to 8.1 million tons (SME), 16 percent above the 7 million tons moved during the same 8 months of 1974/75.

This increase represents a sharp recovery from the same period a year earlier, when net imports of soybeans and meal grew by less than 1 percent.

The combined average monthly rate of soybean and meal imports so far this season has averaged 1.01 million tons (SME), and accounted for 70 percent of the 1.45-million-ton aggregate monthly average import volume for all oilseeds and meals into the six selected markets.

Although imports of soybeans and meal have held a steady share (about 70 percent) of the market for all oilseeds and meals, substantial gains in Brazilian exports have trimmed the growth potential for U.S. exports to many traditional markets.

During the September 1975-April 1976 period—which corresponds to the October 1975-May 1976 period for importing countries when adjusted for shipping lags—U.S. exports of soybeans and meal to all destinations rose to 11.8 million tons (SME)—2.2 million tons above shipments in the same period a year earlier.

Correspondingly, total Brazilian soybean and meal exports for the same period in the current season rose to 3.7 million tons (SME)—nearly 731,000 tons above shipments in the comparable period of 1974/75.

Although the absolute gain in Brazilian exports was much less than for U.S. exports, the relative gain in Brazilian exports at 24 percent slightly outpaced the 22 percent growth rate achieved by U.S. beans and meal exports.

Given current price prospects, growth in oilseed and meal imports into the six major markets is expected to be cut sharply in 1976/77.

SOYBEANS AND MEAL; TOTAL OILSEEDS AND MEALS: IMPORTS INTO SIX MAJOR MARKETS[1] BY COUNTRY
[1,000 metric tons]

Country	Soybeans and meal			Total oilseeds and meals		
	1973/74	1974/75	1975/76	1973/74	1974/75	1975/76
Japan	1,746	1,580	1,664	2,265	1,993	2,101
West Germany	1,525	1,718	1,986	2,323	2,621	3,095
France	972	1,040	1,288	1,357	1,381	1,758
Spain	839	788	1,098	1,043	990	1,238
United Kingdom	511	477	617	906	866	1,164
Denmark	390	420	507	612	645	860
Total	5,983	6,023	7,160	8,506	8,496	10,216
Change from previous period		+50	+1,137	——	−10	+1,720

[1] Expressed in soybean meal equivalent.

SOYBEANS AND MEAL; TOTAL OILSEEDS AND MEALS[1]: IMPORTS INTO SIX MAJOR MARKETS[2] BY MONTH
[1,000 metric tons]

Month	Soybeans and meal			Total oilseeds and meals		
	1973/74	1974/75	1975/76	1973/74	1974/75	1975/76
October	537	765	952	982	1,155	1,405
November	775	968	1,050	1,210	1,420	1,510
December	1,115	979	1,149	1,427	1,384	1,659
January	941	908	1,111	1,318	1,302	1,501
February	678	918	924	1,058	1,194	1,318
March	1,098	623	1,109	1,338	926	1,573
April	839	863	865	1,173	1,158	1,250
May	858	933	——	1,177	1,268	——
June	771	743	——	1,033	1,011	——
July	869	723	——	1,146	1,077	——
August	885	622	——	1,226	979	——
September	651	1,097	——	956	1,568	——
Total	10,017	10,142		14,044	14,442	
Monthly Average	835	845	1,023	1,170	1,204	1,459

[1] Soybean meal basis. [2] Japan, West Germany, France, Spain, United Kingdom, and Denmark.

Syria Pushes Improvements In Grain Storage, Transport

By SHACKFORD PITCHER
U.S. Agricultural Attaché
Damascus

SYRIA's expanding production of grains for both food and feed is bringing about extensive improvement of the country's grain storage capability as well as in grain transport technology.

Such traditional practices as bagging of grain and storing these bags in low-rise warehouses or outdoors under tarpaulins should fast give way to use of high-speed bulk handling equipment and storage in new, lofty concrete silos.

Syria's most important agricultural development activity currently under way is the development of the Euphrates basin. Completion of the construction phase of the high dam on the Euphrates River at Tabaqah—officially renamed Thawra—is expected during 1976.

The priority given this project indicates the country's commitment to more than double its total irrigated production area. The storage and transport projects are substantive improvements necessary to handle the anticipated increased production of wheat and other important grains.

Syrian agricultural production—particularly of grain—traditionally is closely related to the amount and distribution of rainfall, which generally begins in late October-early November and continues until March or April.

Scarcely a drop of rain falls during the summer months, so crops cultivated on unirrigated land during these months rely entirely on the residual moisture accumulated during the rainy season.

The 1975 wheat crop utilized some 1.7 million hectares, or nearly half of the crop land used that year. Only 10 percent of the wheat was planted on irrigated land, but—thanks to generally favorable rains—a good wheat crop was harvested.

Winter rains were abundant, and the grain situation for 1976 appears very favorable. Besides wheat, Syria cultivates about 1 million hectares of barley, much of it in the lower rainfall zones bordering the steppe.

Irrigation water from the Euphrates Dam will permit farming in areas that in the past have not been cultivated because of insufficient rain.

An expansion in area sown to high-yield varieties of wheat will be possible. Some 269,000 hectares of high-yield wheat were harvested in 1975—44 percent on irrigated land and the rest in high rainfall areas.

Water from the Euphrates Dam also may be used to expand production of sugarbeets, corn, rice, and soybeans.

In 1974 at Aleppo, Syria's President Assad officially opened the country's first modern grain silo complex, which has storage capacity for 40,000 metric tons (with an additional 60,000 tons of capacity to be completed by the end of 1976), a 20-tons-per-hour capacity feed mill, and a seed-cleaning and warehousing unit for handling farmers' seed.

Three more silo sites became operational within the next 12 months, bringing the country's grain storage capacity to 130,000 tons at the end of 1975.

Most of Syria's silo sites are served by rail. In northern Syria, rail service is expanding, and a line from the port city of Latakia to Aleppo was opened in 1975. Extension of this line to the northeastern agricultural regions of Hasakeh and Kamishly is planned.

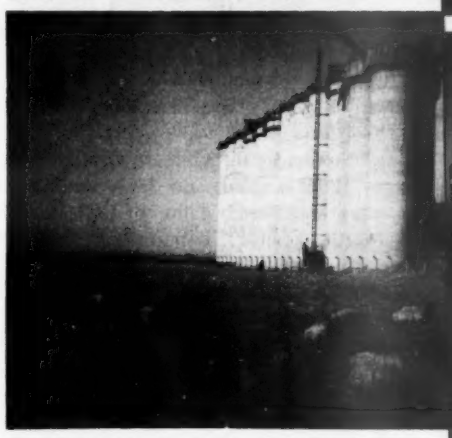
About 250 rail hopper cars, each with a capacity of 50 tons and especially designed for moving grain in bulk, have been purchased. These cars eventually could be used to export Syrian grains to Iraqi destinations and/or to move supplies to Latakia for loading there aboard ships. Imports of U.S. feedgrains, for example, could be transferred at Latakia from ships to rail hopper cars for transshipment to Baghdad.

The silo project originally called for construction of 11 concrete silo complexes with a total capacity of 350,000 metric tons of grain.

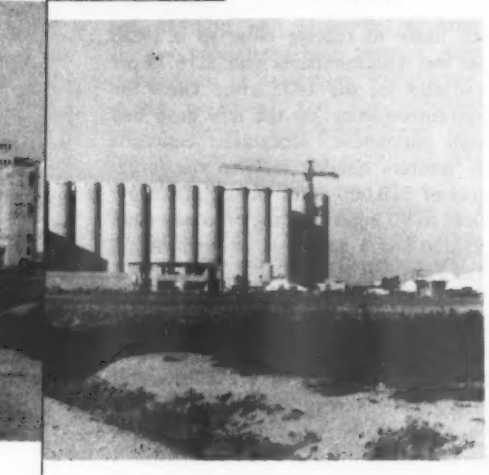
This phase was partly financed by the Kuwait Fund for Arab Economic Development, which extended a $24 million loan to finance the foreign-currency requirements for the silo project.

A Swiss firm is supplying the machinery, a Swedish consulting firm is supervising construction and installation of equipment, and a Syrian firm is responsible for civil construction.

Before the first phase was completed, however, the Syrian Government signed additional contracts with the same firms calling for expansion of the overall project to 770,000 tons capacity, or a total of 810,000 tons including the improvements at the Latakia port silo.



Above: Grain silos at Aleppo, with capacity of 50,000 metric tons. Additional silo construction scheduled for completion by December will expand total capacity to 100,000 tons. Left: the Aleppo silos under construction, 1972, as sheep graze on wheat stubble. Below: Trucks lined up at the Aleppo silos in 1975. Until bulk transport facilities are expanded, such sights will be commonplace.



Cost of the entire project will run to more than $100 million. In addition to the 13 silo sites strategically located throughout the country, a new port silo of 100,000 tons capacity will be built at Tartous and put into operation by the of 1978.

The opening of the silo at Tartous will bring total grain storage capacity at Syrian ports to 140,000 tons, and will permit efficient import as well as export operations. Syria's only existing port silo, at Latakia, was built more than 15 years ago, and was designed primarily for export operations.

Each of the silo sites in the producing regions has a seed cleaning and treating facility. The farmers' seed plants at Aleppo and Hasakeh can clean 10.5 metric tons of grain seed and treat 20 tons per hour.

Three more such farmers' seed facilities were to have begun operating in mid-1976, and three additional facilities are to open in 1977.

There are three certified seed plants at the silo sites in Kamishly, Rakka, and Qalant Al-Madiq—all equipped with special pneumatic intake and internal transport devices for handling seed carefully. The storage capacity at each seed plant is 10,000 tons.

Most of Syria's seed activities are to be managed by the Institute for Seed Multiplication, a specialized agency organized within the Syrian Ministry of Agriculture and Agrarian Reform.

Syria has not lacked good grain storage facilities, but they have been inadequate, particularly during periods following good harvests such as in 1972, when the wheat crop was estimated at 1.8 million tons and the barley crop totaled an estimated 710,000 tons.

The Syrian Cereals Office—the Government agency responsible for marketing wheat, barley, and lentils—purchased some 900,000 tons of wheat and 143,000 tons of barley that year.

Good grain crops were obtained in 1974 and 1975, and the Cereals Office bought some 600,000 tons of wheat and an estimated 193,000 tons of barley from farmers in 1975.

All of this grain was received in bags from the producers and was stored either in low-rise warehouses or in outdoor piles covered with tarpaulins. The four operational silos with their total capacity of 130,000 tons received about 120,000 tons of wheat during the fall of 1975.

Storage for 100,000 tons more is scheduled to become operational during the summer of 1976—in time to receive part of this year's crop before the rainy season begins.

Syria's estimated population of 7.5 million requires about 1.27 million tons of wheat annually. As the population is increasing by about 3.3 percent annually, the country's wheat needs for 1980 could well exceed 1.4 million tons.

Meanwhile, Syria has ambitious programs to expand poultry and dairy production—both areas that have large feedgrain needs. Grain is not used for beef fattening in Syria at present.

Sheep fattening and finishing is handled mostly by cooperatives. Barley is the basic feedgrain used. The sheep co-ops have benefited from the National Feed Revolving Fund, which not only provides funds for purchase of feed but also for construction of feed warehouses.

Sheep co-ops operate about 30 feed warehouses. The 1975 Syrian budget provided for completion of 25 new feed warehouses having a total storage capacity of 100,00 tons of bagged feed.

The General Organization for Fodder (GOFF) was created in 1974 and assigned responsibilities in the public sector for feed and forage. It is expected to take over the new feed mills at the Aleppo and Hama silo sites.

The Aleppo feed plant started production in September 1975 and the Hama plant is scheduled for completion in early 1977. Syria has a number of private feed mills with a total yearly output of some 200,000 tons of mixed feed. GOFF operates feed warehouses and distribution centers with a storage capacity of 300,000 tons, and has plans to increase the total to 700,000 tons by 1980.

THE NEED for efficient operations of the country's new silos offers a challenge to the responsible Syrian Government agencies. Converting from bag to bulk harvesting and transportation will be no small job.

Syria has few combines equipped with bulk tanks. Trucks for moving grain to storage will have to be equipped with hoppers or special sides and endgates.

It may be necessary to build satellite receiving grain centers, where farmers can deliver bagged grain to be cleaned and then shipped in bulk to one of the new silos.

Because of the degree of fluctuation in the size of the wheat harvests between good years and drought years, the Syrian Govenment generally maintains large stocks of wheat, particularly following good harvests.

One of the decisions the Government will have to make is whether the silos are to be used for storage only or for manipulation of supplies to meet requirements during drought years while at the same time taking advantage of export opportunities.

U.K. Boosting Sugar Output As Consumption Decreases

By CLINE J. WARREN
Former Assistant U.S. Agricultural Attaché
London

THE UNITED KINGDOM has started an expansion program to produce by 1980 one-half of its sugar needs instead of the third it now raises. Making the task easier are a drop in consumption, a higher support price for sugar, and a climb in the use of synthetic sweeteners which may reduce future requirements.

One of the main motivating forces in the drive for greater domestic sugar production is the memory of the difficulties encountered in keeping retailers' shelves adequately supplied during much of 1975. The impetus for expansion came after a negotiated settlement had been reached with the European Community, allowing the United Kingdom a quota of slightly over 1.5 million tons of domestically produced sugar.

The goal is to boost white sugar production from the 810,000-metric-ton average of the last 5 years to 1.3 million tons in the next 4 years. This would be equivalent to a yearly growth of almost 10 percent, an expansion in keeping with the Government's aims for the sugarbeet industry, recently outlined in the White Paper, "Food From Our Own Resources."

But a growth rate of this magnitude also would be in marked contrast to the all-but-static situation that prevailed in the U.K. sugar industry during the last decade. On the other hand, if the record 1971/72 crop were taken as a reference point, production has actually trended downward during more recent years. As there has been only a slight variation in planted acreage of late, the lower output mainly reflects adverse growing conditions—inadequate or too much moisture at various stages of plant growth and heavy virus yellow infection.

Raw sugar production in 1976/77 is expected to be 1.1 million metric tons.

Implementation of all governmental policies affecting sugarbeet production in the United Kingdom is left to the British Sugar Corporation (BSC), a commercial undertaking in which the Government currently holds 36.25 percent of the share capital. The Corporation has 17 factories and processes the United Kingdom's entire sugarbeet crop. While no new factories are planned by BSC, major renovation will be undertaken at five factories, with modernization and replacement of some equipment at all the others. Upon completion of this program, the country's yearly sugarbeet processing capacity will have been expanded by 430,000 to 450,000 tons.

The total expansion program is to cost between £75 million and £100 million—slightly over $139 million to $183 million at the April rate of exchange. (In late April, £1 equaled US$1.83, following significant depreciation in March and early April.) The plan calls for a total outlay of £$15 million during 1975/76. Modernization work began at two factories in late 1975.

Based on average yields, an additional 100,000 acres will have to be planted with beets to match expansion in procession facilitics. This will mean a total beet area of close to 600,000 acres by 1980. Suitable land is thought to be available within economical transport distance of the existing factories.

THE REAL QUESTION is whether U.K. beet prices will remain favorable in comparison with those farmers can receive from other arable crops.

Since joining the Community, U.K. beet growers have received less than the producers in the original EC-Six. Starting with the 1976 crop, this will no longer will be the case.

For the upcoming crop, BSC has already guaranteed U.K. growers a basic price of £15 per long ton, irrespective of whether or not the Community's basic price reaches this level. Moreover, BSC has agreed to match any amount by which the EC price exceeds £15 per ton.

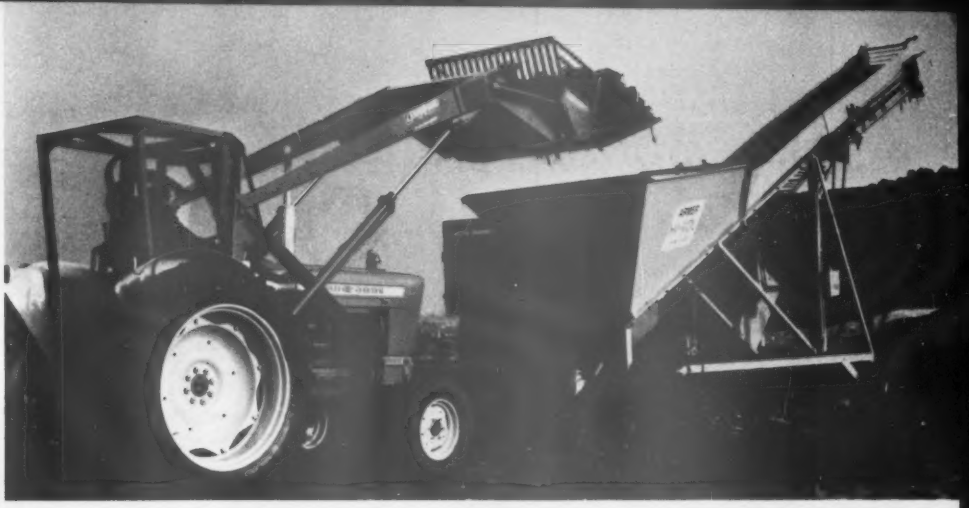
With other benefits considered—delivery bonuses, transportation subsidies, and pulp payments—sugarbeets growers

are likely to receive close to £19.28 per ton. This compares with £16.75 per ton paid for the 1975 crop. Once the guaranteed price for the new crop had been announced, acceptance contracts by growers quickly reached the target goal of 510,000 acres. As of mid-May, close to 90 percent of the crop had been planted and a good rate of germination had been reported.

If more sugarbeets are grown, they will displace other crops—principally barley. But the loss of 100,000 acres of barley from a total of 5 million acres is negligible and production could well be compensated by increased yields of cereal crops planted after sugarbeets are harvested. In addition sugarbeet pulp, produced as a byproduct, would probably yield nearly as much cattle feed as the displaced barley. The extra sugar produced is thus likely to represent a net increase in output.

There is also the added advantage that beets and grains are complementary in their use of labor and machinery in major growing regions. Busy periods for barley are February to March for sowing, and August to September for harvesting. For sugarbeets, these are April to June for seedbed preparation

Mr. Warren is now assigned to Bangkok as U.S. Agricultural Attache.



Clockwise from above: A modern sugarbeet cleaner-loader in U.K. field; lorries loaded with sugarbeets weighing in at automated station at British Sugar Corporation factory at Ely; and exterior of firm's York plant. In the background are sugar storage silos, and beet conveyors are in the foreground.

and thinning, and September to January for harvesting. Thus there is some competition in September when winter wheat is sowed and the sugarbeet harvest begins; but, apart from this, cereals and sugarbeets intermesh well as a basis for rotation.

In addition, sugarbeets serve as a profitable break crop in arable areas, allowing the soil to rest between cereal crops. Apart from vegetables—grown on only a limited area—the most profitable break crops are usually sugarbeets and potatoes. Strong prices for 1976-crop potatoes are thought to be only temporary due to the small 1975/76 harvest, and beets are believed likely to be a more profitable break crop over the long run.

EC membership obligated the United Kingdom to sever its traditional trading ties that had prevailed under the Commonwealth Sugar Agreement. These arrangements were superseded by the EC's commitment to African, Caribbean, and Pacific (ACP) countries at the Lomé Convention in December 1974, to allow their cane sugar preferential access of up to 1.4 million tons each year. The EC has agreed in principle with ACP producers that future deliveries under the agreement are to be related to prevailing sugarbeet prices in the Community.

Lomé Convention sugar provisions are of indefinite duration and make explicit allowances for ACP countries to continue separately as EC sugar suppliers in the event the Convention is allowed to expire and is not replaced.

Indications are that the expansion of U.K. beet processing facilities could create surpluses among the country's two processors of cane sugar imports. Moreover, there is growing concern within the industry as to the degree of accommodation that will be required as beet processing facilities expand while declining imports place less of a demand on these facilities.

ANNUAL U.K. sugar consumption is now close to 2.6 million tons, 200,000 tons less than the 2.8-million-ton average during 1971-74. The higher retail sugar prices, along with a greater availability of alternative sweeteners, suggest that consumption could decline further in the immediate future. Net per capita consumption of refined sugar in 1975 amounted to 102 pounds, 9 percent less than 1974's 112.5 pounds. Only 47.8 pounds of the 1974 total was purchased and used in the home as visible sugar. The remainder was used in manufactured products.

The U.K. Ministry of Agriculture, Fisheries and Food, in a national food survey covering the second quarter of 1975, stated that household purchases of sugar, at 10.1 ounces per person per week, represented a fall at nearly 30 percent, compared with the corresponding period of 1974. The Ministry pointed out that during April/June 1975, the average price of sugar was 31.7 U.S. cents per pound, compared with 12 cents per pound during the corresponding period of 1974.

(Along with BSC efforts to expand the sugarbeet industry, a British subsidiary of a Dutch firm is constructing a plant to produce the recently introduced high-fructose corn syrup. The new plant reportedly will cost £15 million and include facilities for producing various corn starch derivatives. The plant's capacity and intended level of production have not been reported. Scheduled to become operational this year this plant will be the first such facility for producing high-fructose corn syrup in the United Kingdom.)

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Drought Clouds Australian Wheat, Livestock Prospects

Following 6 months of drought, southern Australia finally has received some rain—but not enough to reverse prospects for a wheat shortfall and livestock cutback—according to Harlan J. Dirks, U.S. Agricultural Attaché in Canberra.

Dirks reports that rain in early August brought relief to parts of Australia's drought-stricken south, including some good rains of 1-1½ inches in hard-hit Victoria State. Since its beginning early this year, the drought has traced a pattern similar to one in the same area last year. Then, rains came in time to salvage the wheat crop and permit still another gain in the nation's cattle herd.

Given that experience, Dirks does not rule out fast improvement in grain and livestock prospects this year. He points out, however, that there is little chance for additional seedings of the 1976/77 wheat crop, whose plantings will probably not exceed 7.5 million hectares for a crop of around 8 million metric tons.

This would be some 4-5 million tons off early-season hopes for 12-13 million tons and about 3.5 million tons under last season's harvest..

It would be Australia's smallest harvest since the extremely low 6.6-million-ton crop of 1972/73 and cut sharply into Australia's wheat exports.

Tentative forecasts put these 1976/77 shipments (December-November) at 6.3 million tons, compared with 8.9 million estimated for the 1976/76 marketing year and 8.5 million in 1974/75. This, in turn, would be the lowest level since 1972/73's exports of 4.3 million tons and leave a carryover of only 800,000 tons, compared with 2.1 million in 1975/76.

A leading U.S. competitor in world grain markets, Australia ships wheat primarily to the USSR, the People's Republic of China (PRC), Egypt, Japan, and other Asian markets.

Although chances of seeding more wheat are slim, Dirks points out that "if more rains come, growers will switch to barley or sorghum"—crops that can be planted later with some success. He adds that sorghum does especially well on this driest of the continents although its output normally is only about one-tenth as large as wheat's.

Turning to the livestock situation, Dirks says that pasture conditions vary radically, with pastures excellent in the drought-free north but very poor in the south. Cattle there "just don't have the feed," Dirks says, resulting in both death losses and destruction of animals. "The State of Victoria is paying $10 a head to shoot animals," he adds, and guesstimates of losses indicate that "as many as 20 million sheep and 2 million cattle could die before the drought is over."

Consequently, Australia's cattle slaughter is running about 18 percent above last year's, weights are down, and there is a surplus of lower quality animals. While this situation is reflected in reduced prices for grass-fed cattle, prices for premium quality fat cattle are holding up fairly well, Dirks adds.

The dairy industry, centered in Victoria, likewise is hard hit, with milk output there expected to decline 20-30 percent this year.

To compensate, says Dirks, "The grazing groups are asking for all kinds of Government assistance to get them through this drought crisis—they claim they are at the mercy of both the weather and the market at the moment."

The long-term consequences foreseen by Dirks: Some cattle herds will be cut back sharply, and worn-down pastures in the drought area will not come back quickly. There is still optimism that rains in the near-term could save nucleus herds, but the country's heretofore steady herd buildup—to a record 33.5 million head as of March 31, 1976—seems to have come to a temporary halt. This previous rapid expansion contributed greatly to the beef glut that has plagued beef exporters since 1974.

Similarly, the nation may find recent worries over dairy-product surpluses temporarily assuaged as a result of prospective cuts in milk output. As of June 30, 1976, those dairy surpluses included 90,000 tons of nonfat dry milk and 40,000 tons of cheese.

Although the drought has been reminiscent of the one that hit Australia last year, it is unlike most typical droughts. While such droughts usually are in the summer and concentrated in a north-south band extending through Queensland, New South Wales, and South Australia, this winter drought cuts a swath across all of the south where rainfall normally is ample. Had it followed the traditional pattern, Dirks says, it would have ranked among the most severe droughts to hit Australia.

*U.S. GOVERNMENT PRINTING OFFICE: 1976 211-407/59 1-3